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SUBJECT

FORWARDING OF CHANGE 4 TO HURRICANE HAVENS HANDBOOK

TO:

Distribution
[NAVENVPREDRSCHFAC Master Distribution List,
Hurricane Havens Handbook]

DATE

31 Mar 89

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REFERENCE

ENCLOSURE

(1) Change 4 to Hurricane
Havens Handbook for the
North Atlantic Ocean,
NAVENVPREDRSCHFAC
Technical Report
TR 82-03

VIA

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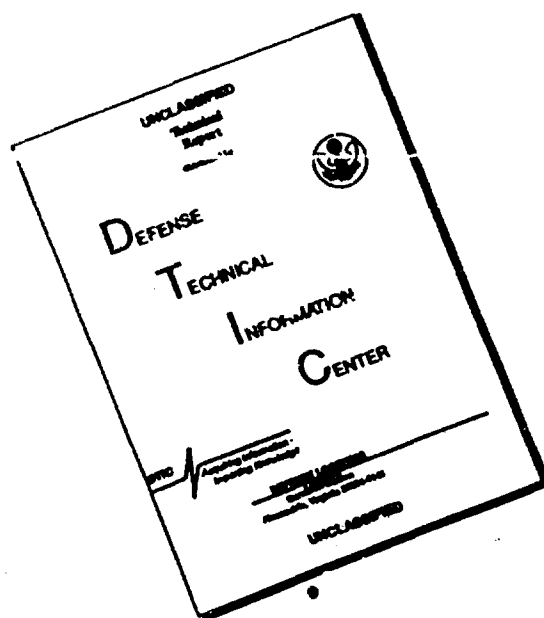
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2.3 NORFOLK NAVAL SHIPYARD (FIGURE II-1)

The Norfolk Naval Shipyard is situated along the southern branch of the Elizabeth River, approximately five miles south of the naval station. It can accept ships of any draft at any stage of the tide. Again, the reader is referred to the following publications for details of the harbor and its facilities:

DMA Hydrographic/Topographic Center Publication 940 Chapter 5,
Fleet Guide to Hampton Roads
Chart 12221, Chesapeake Bay Entrance
Chart 12253, Norfolk Harbor and Elizabeth River

3. HEAVY WEATHER FACILITIES AND HURRICANE ANCHORAGES

3.1 TUG AVAILABILITY

Commanding Officers of vessels who may be required to shift berth, move to an anchorage, or put to sea in the event of a tropical cyclone affecting the Norfolk area should bear in mind that the services of the limited number of tugs will be at a premium before and after the passage of a tropical cyclone. Demand for tugs will be particularly high at certain stages of the tide and during normal working hours. Calls for towage assistance, especially for smaller vessels, should therefore be kept to a minimum.

3.2 HURRICANE ANCHORAGES

Hurricane anchorages have been designated in the central part of Chesapeake Bay. One set of anchorages lies in the south central area of the bay (Figure II-3), and another set of anchorages lies in the central area of the bay (Figure II-4). The relevant charts are 12221, Chesapeake Bay Entrance; 12225, Chesapeake Bay-Wolf Trap to Smith Point; and 12230, Chesapeake Bay-Smith Point to Cove Point. All hurricane anchorages are 3000 yards in diameter and are allocated using the following guidelines:

- (1) Norfolk Sub-Area: Anchorages 01 through 28.
- (2) Little Creek Sub-Area: Anchorages 29 through 42.
- (3) Hurricane Anchorages will not be assigned to submarines.
- (4) Anchorages will be assigned to USCG ships if requested by Coast Guard authorities.

Order of departure, time interval and anchorage assignments are made as early as possible for planning purposes. Sortie is executed on order of SOPA Hampton Roads. Ships and afloat staff should be familiar with COMNAVBASENORVA/SOPA (ADMIN) HAMPINST 3141.1 (series) DESTRUCTIVE WEATHER PLAN which contains



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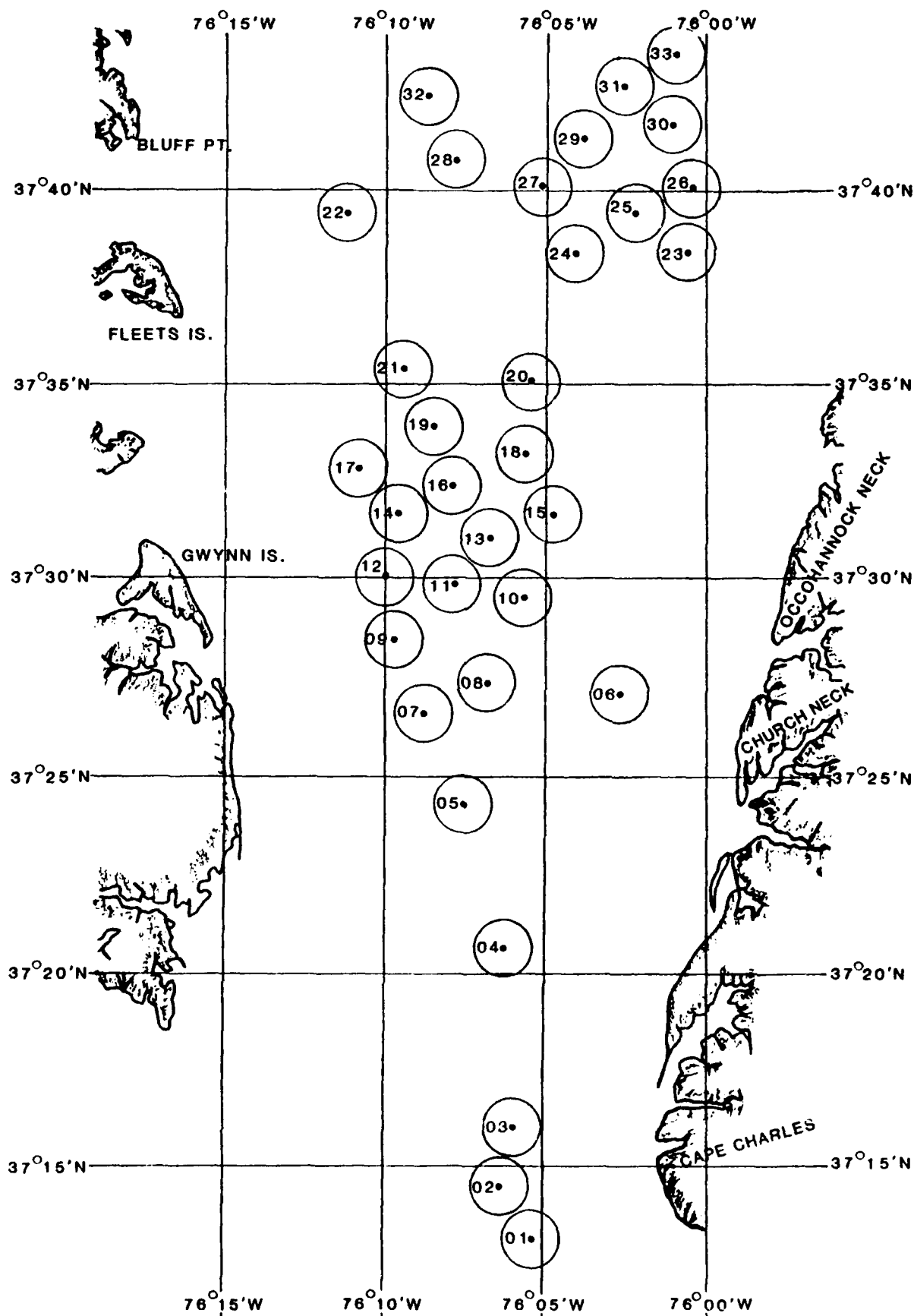


Figure 11-3. Layout of anchorages in south-central Chesapeake Bay.

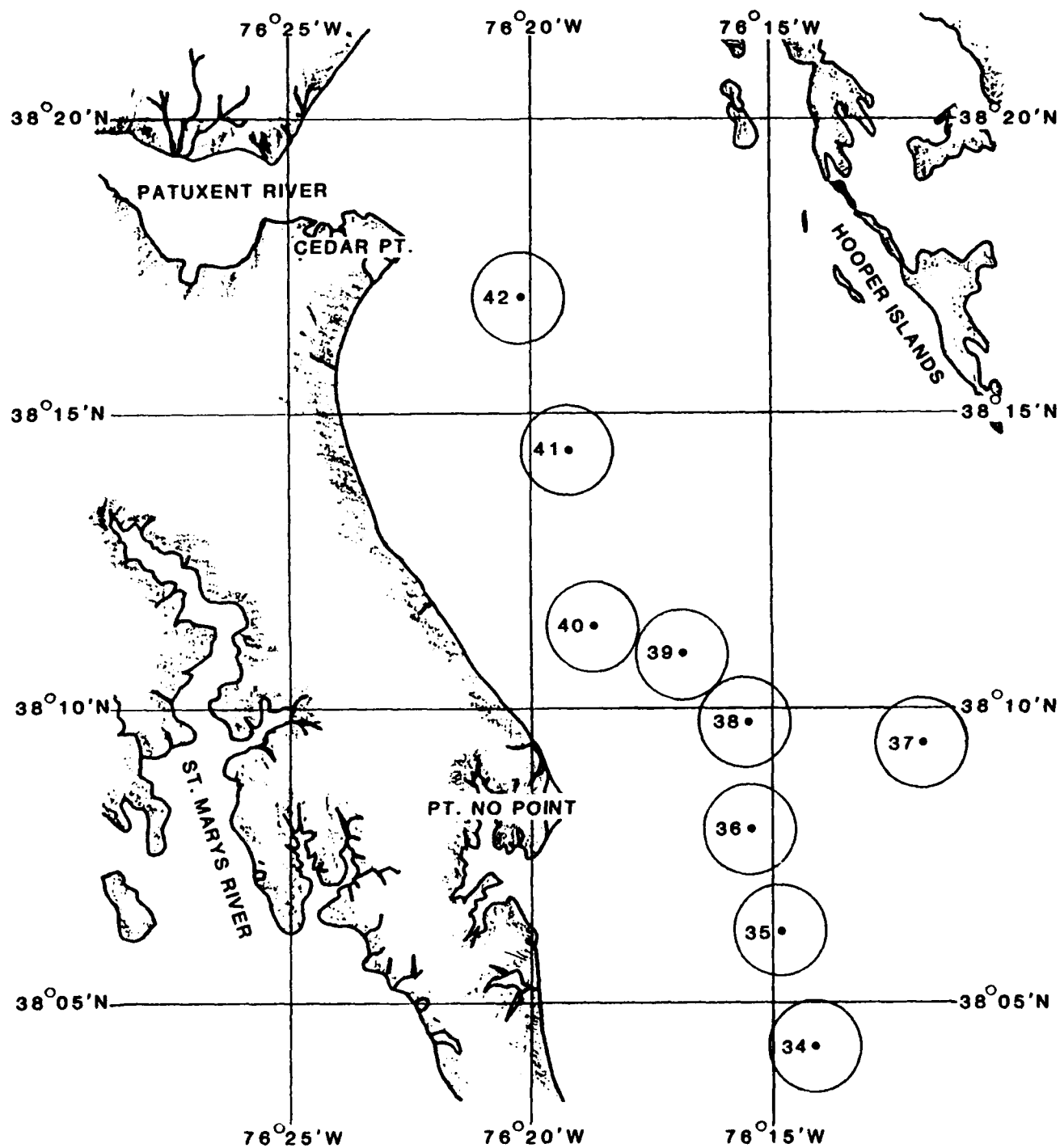


Figure II-4. Layout of anchorages in central Chesapeake Bay.

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instructions for hurricane measures in the Hampton Roads area. SOPA sets hurricane/tropical storm conditions for ships and initiates order movements to hurricane anchorages when anticipated winds indicate such action is prudent.

4. TROPICAL CYCLONES AFFECTING NORFOLK

4.1 CLIMATOLOGY

For the purposes of this study, any tropical cyclone approaching within 180 n mi of Norfolk is considered a threat. It is recognized that a few tropical cyclones that did not approach within this distance may have affected Norfolk in some way, but a criterion had to be established for this report.

Although tropical cyclones have occurred in the North Atlantic during most of the year, the majority of those which threaten Norfolk occur from August to October. Figure II-5 shows the monthly summary of tropical cyclone occurrences based on data for the 41 years from 1945 to 1985. Of the 64 tropical storms which threatened Norfolk in the period (less than two threats per year), 59 occurred in the period between June and October with the peak threat during August/September.

Figure II-6 presents the above storms as a function of the compass octant from which they approached Norfolk. The open numbers indicate the number of cyclones which approached from that octant. The numbers in parentheses represent the same information, but as a percentage. It is evident from this figure that the majority of cyclones approach Norfolk from the south.

Approximately 1.6 tropical cyclones a year pose a threat to Norfolk. Since Norfolk lies at such a high latitude (37°N) most of these cyclones are in the process of recurving from a westerly track onto a more northerly track. During this process, the tropical cyclones tend to accelerate their forward movement to an average speed of 16 kt to 18 kt at closest point of approach (CPA) for those storms approaching from the south and southwest. Those storms which are still on a westerly or northwesterly track have an average forward speed of only 10 kt to 12 kt in this region. The direction the storm passes at CPA is important because storms to the west (over land) will tend to weaken.

Figures II-7 to II-10 are statistical summaries of threat probability based on tropical cyclone tracks for the years 1945 to 1985. The data are presented monthly during the main portion of the hurricane season, August through October (Figures II-7, II-8 and II-9). Figure II-10 is for the remainder of the year and Figure II-11 is for the whole year. The solid lines represent the "percent

HURRICANE ANCHORAGE LOCATIONS

ANCHORAGE	LAT (N)	LONG (W)	MINIMUM DEPTH
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(All anchorage swing circles are 1500 yards radius)

CHART 12221 (80,000:1) and CHART 12224 (40,000:1)

01	37°13'15"	076°05'13"	37'
02	37°14'28"	076°06'26"	35'
03	37°16'00"	076°06'01"	46'
04	37°20'30"	076°06'21"	38'

CHART 12225 (80,000:1) and CHART 12226 (40,000:1)

05	37°24'17"	076°07'33"	38'
06	37°26'59.5"	076°02'40.5"	42'
07	37°26'36"	076°08'48"	34'
08	37°27'15.5"	076°06'55.5"	35'
09	37°28'30.5"	076°09'40"	34'
10	37°29'25"	076°05'54"	37'
11	37°29'40"	076°07'46.5"	36'
12	37°30'00"	076°10'00"	34'
13	37°31'01.5"	076°06'46"	37'
14	37°31'40"	076°09'35.5"	35'
15	37°31'41.5"	076°04'53.5"	38'
16	37°32'23"	076°07'49"	37'
17	37°32'52"	076°10'47"	33'
18	37°33'13.5"	076°05'47.5"	37'
19	37°33'54"	076°08'38"	38'
20	37°35'17"	076°05'35"	38'
21	37°35'25"	076°09'34"	40'
22	37°39'37.5"	076°11'15"	41'
23	37°38'34.5"	076°00'49.5"	31'
24	37°38'41"	076°04'04"	37'
25	37°39'31"	076°02'22"	35'
26	37°40'04.5"	076°00'23"	33'
27	37°40'11"	076°05'05"	37'
28	37°41'00"	076°07'52"	38'
29	37°41'28"	076°03'52"	32'
30	37°41'40"	076°01'04"	31'
31	37°42'44"	076°02'40"	32'
32	37°42'28"	076°08'53"	38'
33	37°43'36"	076°01'01"	31'

CHART 12230 (80,000:1) and CHART 12233 (40,000:1)

34	38°04'18.5"	076°14'04"	42'
35	38°06'17"	076°14'53"	41'
36	38°08'02"	076°15'29"	42'
37	38°09'25.5"	076°11'52"	34'
38	38°09'49"	076°15'35"	41'
39	38°10'59"	076°16'52"	41'
40	38°11'34.5"	076°18'47"	37'
41	38°14'37.5"	076°19'15.5"	36'
42	38°17'12"	076°20'18.5"	41'

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